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I

PHYSICAL EDUCATION

FROM THE STANDPOINT OF "ADJUSTMENT"

There are many angles from which one may approach the task of demonstrating the place of physical education in the general educative program. The methods employed by the numerous apologists of physical education in their efforts to impress educators and the general public with the importance of their subject have been conditioned, in the main, by their conception of the "aims" of education.

Thus we have the Greeks with their underlying concept of harmony and beauty defying exercises of skill and endurance because of their usefulness in the attainment of aesthetic aims. Later we find Locke and his followers of the disciplinary school advocating physical training as a sort of "hardening process"—a part of a rigorous course of sprouts for the inculcating of moral and physical vigor. Rousseau and the naturalists, on the other hand, believed that through physical activities we must develop that healthy, natural foundation without which all striving for the so-called higher values is futile. If we follow a step further the historical trend in the development of aims and ideals we find the next outstanding group of innovators—Pestalozzi, Herbart, Froebel—and other leaders of the psychological movement advocating it as a part of the general process of unfoldment—in other words as a means of "self-expression." And so we should find, were we to analyse the tenets of all the great leaders in education, that the "training" or the "development" or the "education" of the body has been conceived as an essential part of all the systems. There is not space, however, in such a paper as this for such an analysis, nor would it be interesting to any except a student of the history of physical training.

Let us come at once, then, to the contemporary period, for it is with a contemporary

problem that we are concerned. Even here we are confronted with a variety of ultimate educational aims, and hence with an equal variety of concepts concerning the role of physical education in the attainment of those aims. To pass with mere mention such names as Herbert Spencer, Father John Ling, Gut-smith, Dio Lewis, Stanley Hall, J. M. Tyler, Luther Gulick, and Theodore Roosevelt is indeed to ride rough shod, but, as we have already stated, this is not a historical treatise.

It is my purpose to select from among the contemporary leaders in the field of education the one man whose conception of the aim of education seems, without question, to lead greater force to the movement for physical education than does that of any other outstanding educational leader, namely, Professor M. V. O'Shea.

I have no quarrel with those who defend physical education as a form of discipline, or for its aesthetic value, or as a form of therapeutics even. Much may be said from these points of view, and indeed it is extremely useful to have a problem of such magnitude attacked from different angles. If we, as teachers, would regard the efforts of other groups as merely auxiliary to, or even co-ordinate with our own, there would be no occasion for a further attempt to justify the incorporation of physical education in the general educational program. It too often happens, however, that even our most intelligent and competent teachers are quite willing to hand the whole problem of the conservation and improvement of health and the training of the body over to anybody who will accept the responsibility. The physical training teacher in our secondary schools quite frequently finds his efforts greeted by the majority of his associates either with the coldest indifference or with outright antagonism. The feeling that this sort of thing is well enough for the athletic trainer or the circus performer is still too common. I am not speaking now of responsible authorities. In this quarter we find well-nigh universal ac-

ceptance, but the best intentioned officials are powerless without the intelligent and enthusiastic co-operation of the class teacher. But how is this to be secured? This is the problem which confronts those who are held responsible for the successful operation of programs of physical education, and this group includes the entire administrative and supervisory staff, from the commissioner down to the county or municipal supervisor, together with the principals or other administrative heads of institutions, and their directors of physical training and health activities.

I believe the remedy is to place more emphasis in the training of the class teacher upon this fundamental problem: How can educational practise be modified so as to more adequately provide for the conservation and improvement of the biologic foundation of life? It is with genuine conviction that most teachers shun health problems. There has been little in their training to create an active interest in the elemental, conditioning factors of life. Too many earnest souls have been turned loose on an unsuspecting public with no better preparation for their calling than a smattering of faculty psychology and the disciplinary theory. Once they have been shown clearly and concretely just how the program of physical training and health guidance co-ordinates in a workable manner with some satisfactory definition of education, I believe there will be little difficulty in enlisting their full co-operation.

It would be interesting at this point, no doubt, to analyse some of the well-known modern aims of education to the end that the reader might understand more clearly the process by which the "adjustment" aim has been selected for our purpose. It will suffice, however, merely to touch very briefly upon the relation of this particular conception of education to the general educational thought of the time.

The statement of the aim of education as "adjustment" has been familiarly used by educationists throughout the contemporary period. Nicholas Murray Butler speaking in 1896 said: "If education cannot be identified with mere instruction, what is it? I answer, it must mean a gradual adjustment to the spiritual possessions of the race" (11:17.) Horne writing in 1903 defines education as "the eternal process of superior adjustment

of the physically and mentally developed, free, conscious, human being to God, as manifested in the intellectual, emotional, and volitional environment of man" (36:285). Judd in his *Genetic Psychology for Teachers* takes a view somewhat similar to that of O'Shea. (See, for example, Chapter V.) He constantly employs such phrases as "adaptation to environment" and "the doctrine" or "the principle of adaptation." But none has worked out the theory so clearly or in so much detail as has Professor O'Shea.

He did this for the public in general in his *Education as Adjustment*, published in 1903. The material, however, had been given to his classes as lectures for several years previous. Reudiger, speaking of the adjustment aim says: "While the definition of education as adjustment to life is very general, as a brief definition of so large a subject as education necessarily must be, it nevertheless includes just the essential points. It is broad enough to embrace all stages and varieties of education, and views the subject from the scientific viewpoint, which is one of the strongest points in its favor. . . . It removes education from the realm of philosophical and theological opinion and other partial views, and places it on the same dignified footing as medicine and engineering and other callings based upon the sciences."

To be sure one can scarcely claim for any particular definition a scope and application broad enough to meet with universal acceptance in a period marked by its diversity. The modern tendency, if anything, must be characterized as eclectic. Yet it is interesting to note how near the adjustment aim comes to including even the wide variation of aims among modern educators, which for convenience we characterize as eclectic.

Now, since the character of the adjustment aim has up to this point merely been implied, it will be well, before proceeding further, to agree upon something more definite and precise as a definition. Stated from the biological viewpoint it is the adjustment of the individual to the life in which he is to participate. "Environment" might be substituted for the word "life," but not without a change in meaning which seems to be unwarranted. The term "environment" is usually accepted as having objective reference only, where "life," in addition to the purely ob-

jective factors, includes those subjective aspects of existence with which education must deal. Reudiger, interpreting the adjustment aim, says that "to educate a person means to adjust him to those elements of his environment that are of concern in modern life, and to develop, organize, and train his powers so that he may make efficient and proper use of them." Here we have very clearly a recognition of both the objective and subjective aspects of the educative problem.

To discuss in all its bearings and implications the significance of adjustment would be to go far outside the field of physical education. Though there is no clear-cut line of demarcation between the psychological and physiological aspect of life, we must, for very obvious practical reasons, select a particular phase of the general program which we shall agree to call the field of physical education. Stated broadly, then, we can define physical education as that aspect of the educative scheme which has for its aim the physical or organic adjustment of the individual to his environment. Though our program will take cognizance of certain subjective factors, it will be observed that the term "environment" is here employed in preference to "life" for the purpose of narrowing somewhat the scope of our discussion, and also because it renders more simple the task of elucidation.

Throughout the world of living things, wherever we find them existing in the state of nature, adjustment, or—to use the biologist's term—adaptation, plays an important role in the scheme of organic evolution. Animals, in general, are well adapted to their environment. Failing adaptation, we witness everywhere evidences of the rapid extinction of species. It is only those species which succeed in adapting themselves to their environment that survive the ravages of relentless nature. One becomes so familiar with examples of this that an enumeration of instances seems superfluous. Protective coloration is one of the best examples. Witness the plumage of birds, the changing color of the hare, the white of the polar bear, and the stripes of the zebra. We are told of the numerous examples of mistaking the insect called "walking-stick" for a twig, only to be horrified by having it move in the hand. The grouse is mottled to resemble the foliage

of its habitat; and so on throughout the list.

Now what is true of the body as a whole is true also of its parts. Every organ is fashioned to perform the function to which it has been accustomed through the long period of the evolution of the species. In the case of the human organs they are adapted to the conditions to which the organism has been habituated throughout the major part of its period of phylogenetic development. Let us see what these conditions have been.

To be sure, we know little of the conditions which have fashioned our bodies until a comparatively recent period. The conditions during aeons preceding the period of recorded history are enshrouded in the mysteries of geological theory. We have ample evidence, however, that they were crude, extremely simple, and rigorous beyond description. The diet was coarse and bulky, and the pursuits by which our primitive ancestors gained their simple portions required qualities of mind and body which we have long since discarded for gentler arts. Doubtless they were qualities requiring great strength and endurance combined with forms of muscular skill and co-ordination developed to a point of perfection unknown during the modern period. Thus we have developed a musculature comprising 48% of the body weight, and out of all proportion to our present needs. This huge mass of muscle tissue at one time functioned in performing the crude feats of strength and endurance necessitated by the relentless struggle for existence and the arduous pursuit and capture of the means of subsistence. We have also inherited an intestinal tract some twenty-eight feet in length. It is as long as that of the largest herbivora—the horse, cow, and sheep. Such a digestive equipment could have been adapted only to a very coarse, bulky, herbivorous diet. Then, too, we have a circulatory system which could have developed only in response to a demand for much more ample and rapid oxidation than we experience to-day. Our respiratory organs are more than adequate for our present needs.

During the period antedating civilization the environmental changes were sufficiently gradual to permit of the necessary adaptive changes on the part of the organism. Nature, apparently, was able to synchronize the changes of the organism with the con-

comitant adaptive modifications of the environment. This state of synchronization, so to speak, obtained up to the dawn of civilization. The recently acquired ability of man to modify environment artificially marks the beginning of that maladjustment between organism and environment which is responsible for a host of human disabilities and ailments. At the point where man begins artificially to modify his environment perfect synchronization ceases. During the period of civilization environmental changes have been wrought with such rapidity that nature has been unable to make the necessary adaptive changes in the organism.

Let us observe more closely a few examples of this failure in adaptation. Take for example the large, bulky, powerful musculature of the human body. Under the conditions which constitute the environment of large masses of human beings there is no adequate function for such a structure. The consequence is a degree of flabby tonelessness that constitutes a serious menace to the general health of the individual. Or consider the long and over-ample digestive tracts, requiring for healthful functioning large masses of relatively coarse, bulky food. The inadequate demands made upon it by our modern dietaries indicate a degree of stagnation and general intestinal inactivity which imperils the health of the entire organism. General practitioners in medicine tell us that fifty per cent of the common ills for which they are summoned have their origin in a partial clogging of the intestinal tract—in other words, constipation. To cite one more example from the many which would suggest themselves at once to the physician, let us consider the respiratory tract. Here too we have the same discrepancy between structure and function. It is a well-known fact that we use in ordinary breathing only slightly more than half of our lung space. It requires forced activity to bring into play the very considerable unused air spaces. These unused areas furnish culture media for the tubercular bacillus. It would be misleading, obviously, to state that tuberculosis is invariably traceable to respiratory inactivity, but it is nevertheless an important factor. If we add to these examples the effects of housing congestion, factory conditions, the speeding-up process in industry and business with its accompanying

strain on the nervous system and neglect of the organic basis of life, we have a situation which bodes ill for the organic welfare of the race. Practically all of the much-talked-of disabilities discovered by the draft board examiners are of this same group of maladjustment defects. The various types of orthopedic defects, the impairments of vision, the cardiac disorders, and abnormalities in the weight-height ratio, are all clearly traceable to failure in the adaptive process of the organism.

Now we begin to see more clearly the significance of our caption, "Physical Education from the Standpoint of Adjustment." Many of the disabilities enumerated must, to be sure, be assigned for treatment to the practitioner of preventive medicine. Quite as many, however, and all to some degree, fall within the province of physical education. To the degree that physical education can correct or relieve these conditions it must be accorded a place in our program of adjustment. Since we may no longer depend upon the blind natural forces of adaptation and selection for the conservation and improvement of life, it behooves us to seek by what means we may consciously and intelligently supplement, or even supplant, the agencies which by our ingenuity we have so completely interrupted. The question we must ask ourselves is: to what extent can a comprehensive program of physical education be employed as an instrument of adjustment? As a first step in answering our question we must again define the scope and legitimate aims of this important aspect of education.

Physical education, properly speaking, includes not only the adequate means for the muscular and organic development of the body, but also the imparting of definite information pertaining to health and disease, and their determining factors. We must also include practical measures for the prevention and removal of remedial defects. Hence we may define it as that aspect of the general problem of education which has for its aim the proper discipline and the normal muscular and organic development of the human body through muscular exercise and the imparting of adequate knowledge of the principles and habits of health. Translated into a practical school program, this would include:

1. Daily inspection for the detection of infections or other remediable defects.

2. Brief (about 2 minutes) periodic calisthenic drills given by the class teacher for the purpose of restoring somatic tone and for relieving visceral humoral stasis.

3. Systematic instruction in the principles of personal and community hygiene. Here we should include such knowledge and practice of diet, exercise, rest, bathing, etc., as would go far to correct the muscular and organic aspects of maladjustment.

4. At least one school period daily devoted to systematic disciplinary and body building work under competent direction in the gymnasium.

5. A comprehensive program of competitive, recreative activities in which all pupils should be required to participate.

6. Periodic health examinations with accurate records of defects and adequate measures for "follow up" and correction.

Many of our states have already passed laws providing for a portion or all of the measures outlined. Still others are hastening to follow their example. New York State, for example, provides by law for the following:

- A. Daily morning hygiene inspection—performed by the class or section teacher with reporting of defects to the physical training teacher or the school nurse.

- B. Two-minute drill—given four times during the day by the class teacher at the beginning of stated periods.

- C. Instruction in hygiene of not less than two fifteen-minute periods per week. This is given by physical training teachers, biology teachers, or regular class teachers.

- D. Formal gymnastic instruction of not less than two thirty-minute periods per week given by physical training teachers. This instruction could be given, if necessary, by adequately trained class teachers.

- E. Not less than three periods of supervised recreation.

This program includes all of that outlined above except the periodic physical examination and shows how much of such a scheme may be carried out by the class teacher.

To treat adequately the relation to health

and general scholarship of such easily discoverable and remediable defects as enlarged and defective tonsils, adenoids, dental and oral defects, defective vision, hearing, posture, etc., would require more space than is here allotted, and such a task would be unnecessary since the literature on the subject is already voluminous. Then, too, the purpose of this paper is not so much to provide a program or to supply detailed, technical information as it is to sketch the relation of physical education to the general educative plan. It is designed primarily to convince the skeptical and to stimulate the indifferent rather than to guide the practitioner. To recapitulate, education has well-nigh universally been concerned with some concept of bodily development.

There have been periods of reaction, usually marked by their asceticism, during which the body has been deliberately neglected.

Even during periods when physical education has been emphasized, it has often been imperfectly co-ordinated with the general plan.

This failure definitely to relate the training of the body and the conservation of health to the general scheme has led too frequently to its repudiation by the teaching staff.

Consequently, since the classic period, it has been championed by a relatively small group of zealots who have been compelled to struggle for recognition against the inertia or prejudice of their associates.

Beginning with the present generation it has been generally accepted by our educational leaders as an important phase of the educational program.

The teaching profession in general, however, has maintained a reactionary attitude. It has been either indifferent or frankly antagonistic.

The remedy for this attitude is to provide in the education of the teacher for a more thorough training in the fundamental biological aspects of life, and to show more clearly how physical education fits into some acceptable aim of general education.

The latter is provided by the adjustment aim.

Though the method of procedure must be supplied by the specially trained professional expert, much of the practical work of a com-

prehensive physical education program can be carried out by the class teacher.

The hearty and cheerful acceptance of responsibility by the teacher for this important phase of the child's training is necessary to the realization of any complete scheme of preparation for life.

T. BRUCE KIRKPATRICK

II

TEACHING AGRICULTURE IN THE RURAL SCHOOL

In arranging one's course of study for agriculture in our rural schools, there are many important things for the teacher to consider. In the first place, it should be borne clearly in mind that the course of study prescribed by the State Board of Education is merely suggestive, for it is absolutely impossible for any one to prepare an outline course of study suitable to each one of our one hundred different counties, having as many different types of farming as we have in Virginia. For the same reason, because of our diversified agricultural conditions, no textbook can be expected to meet all of our demands. Usually part of the textbook should be omitted. This should be supplemented with bulletins prepared by the United States Department of Agriculture, Washington, D. C., State Board of Agriculture, Richmond, Va., and Virginia Polytechnic Institute, Blacksburg, Va.

Before making any attempt to arrange a course of study for a school, it is imperative that the teacher should know the type of farming followed in that particular community, as well as the whole county, the important animals, crops, plant diseases, and serious insect pests of the community. This information may be obtained by a survey of the community in question, by referring to the United States Census, or more easily by consulting the County Agent. Taking Rockingham County as a whole, the important animals are draft horses, dairy cattle, beef cattle, poultry, sheep, hogs, and the honey bee. The important crops are corn, including corn for grain and silage, wheat, and the minor

cereals, pasture, alfalfa, hay, legumes, fruits and vegetables. From an economic standpoint, the important plant diseases are: wheat scab, bunt smut of wheat, loose smut of wheat, root rot of corn, bitter rot of apples, scab of apples, cedar rust of apples, root rot, blight and canker of apples, violent root rot of alfalfa, black rot of grape, black knot and brown rot of plum, brown rot of peach, peach scab and peach curl, potato scab and blight, tomato blight, root rot of cabbage and corn smut. The important insect pests are codling moth, curculio, Hessian fly, San Jose scale, eel worm, or nematode disease of wheat, Colorado potato beetle, and aphides, or plant lice. The foregoing list by no means includes all of our plant diseases and insect pests, but it embraces the most important from an economic standpoint. All the most serious of these pests, including the diseases of wheat and corn, have been mounted by the students of Bridgewater Agricultural High School for illustrative purposes in class work. Teachers desiring to become familiar with these plant diseases are welcome to visit this school. A recent survey of the state by the Extension Division of V. P. I. reveals the alarming fact that Virginia lost ten per cent. of her wheat crop last year because of the above-mentioned wheat diseases. The percentage of loss in Rockingham County was even greater than in the state at large. Using the state percentage of loss as a basis of our calculation, we find that Rockingham County last year sustained a loss of nearly three hundred thousand dollars due to wheat diseases alone.

After the teacher decides definitely what he expects to teach, the next important step is to arrange the material constituting the course of study according to seasonal sequence.

Preparation of the land and seeding cereals should be the first thing to be taught in the fall, as this work is being done on the farm when school opens. Just before corn is ready to cut is the time to select seed corn from the field. There is always a field of corn near the schoolhouse; hence the selection of seed corn in the field should be given as a field trip about this time. The writer has yet to find a farmer in Rockingham County not willing to co-operate in instruction of scientific agriculture. Yet before taking a